CLAIMS

1. A polynucleotide of any of the following (a) to (e), encoding a protein that specifically binds to a substance WF00144:

(a) a polynucleotide containing a base sequence of SEQ ID NO: 1 or 3;

(b) a polynucleotide encoding a protein that comprises an amino acid sequence of SEQ ID NO: 2 or 4;

(c) a polynucleotide encoding a protein that comprises an amino acid sequence of SEQ ID NO: 2 or 4 where one or plural amino acids are substituted, deleted, inserted and/or added;

(d) a polynucleotide hybridizing with a polynucleotide that comprises a base sequence of SEQ ID NO: 1 or 3, under a stringent condition;

(e) a polynucleotide having at least (1) 88 % homology, (2) 92 % homology or (3) 96 % homology to the base sequence of SEQ ID NO: 1 or 3.

2. A polynucleotide encoding a partial peptide of the protein encoded by the polynucleotide of claim 1.

3. A peptide or protein encoded by the polynucleotide of claim 1 or 2.

4. A vector containing the polynucleotide of claim 1 or 2.

5. A transformant having the polynucleotide of claim 1

or 2, or the vector of claim 5.

6. A method for producing the peptide or protein of claim 3, which includes a step of cultivating the transformant of claim 5 and collecting the expressed product.

7. A polynucleotide comprising a base sequence complementary to the polynucleotide of claim 1 or 2 or to the complementary chain thereof, and having a length of at least 15 bases.

8. An antibody to the peptide or protein of claim 3.

9. An immunoassay method including a step of observing the immunological reaction between the peptide or protein of claim 3 and the antibody of claim 8.

10. A screening method for a sugar production-regulating substance, which includes the following steps:

(1) a step of contacting a candidate substance with cells that express a protein encoded by the polynucleotide of claim 1; and

(2) a step of cultivating the cells under the condition under which the synthesis of the protein of claim 3 is induced, and selecting the candidate substance that regulates sugar production.

11. A screening method for a sugar production-regulating substance, which includes the following steps:

(1) a step of contacting a candidate substance with cells having a vector introduced thereinto, where the vector contains a region of regulating the expression of a gene that comprises the base

sequence of SEQ ID NO: 1 or 3 and a reporter gene functionally bound downstream to the region;

(2) a step of measuring the activity of the reporter gene; and

(3) a step of selecting the candidate substance that increases or decreases the reporter activity in the step (2), as compared with a control.

12. A medicine that contains the compound obtained according to the method of claim 10 or 11.

13. A medicine that contains the peptide or protein of claim 3.

14. A medicine that contains an anti-sense polynucleotide to the protein-encoding sequence of the polynucleotide of claim 1.

15. A medicine of claim 12 or 13, which is for prevention or treatment of diabetes.

16. Use of the compound obtainable according to the method of claim 10 or 11, for regulation of sugar production.

17. A method of detecting diabetes, which includes the following steps:

(1) a step of determining the expression condition of the polynucleotide of claim 1;

(2) a step of comparing the determined result in (1) with the polynucleotide expression condition in a normal state;

(3) a step of correlating the change in the polynucleotide expression condition with diabetes, as a result of the

comparison.

18. A polynucleotide of encoding a protein, which comprises an amino acid sequence of SEQ ID NO: 2 or 4 where one or a few amino acids are substituted, deleted, inserted and/or added, and which has a dominant-negative phenotype to the protein that comprises the amino acid sequence of SEQ ID NO: 2 or 4.

19. A screening method for a sugar production-regulating substance, which includes the following steps:

(1) a step of contacting a candidate substance with the peptide or protein of claim 3;

(2) a step of determining the binding condition of the peptide or protein to the candidate substance, and selecting the complex;

(2) a step of separating the candidate substance from the complex selected in the previous step.